

Evaluation of a Hydrolox Traveling Screen in the Secondary Channel at the Tracy Fish Collection Facility

Investigators

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Summary

The existing louver systems at the Tracy Fish Collection Facility (TFCF) are not as efficient as originally designed, in part because of changing aquatic debris conditions (Boutwell and Sisneros 2007). Increased aquatic vegetation impacts the hydraulic performance of the louver-bypass system and holding tank conditions. The louvers require daily cleaning which is an elaborate process. In the primary channel, individual louvers must be raised for cleaning which creates a 2.4 m (8ft) gap in the louver wall. This potentially allows for downstream fish losses and upstream movements by predatory fish. In the secondary channel, the louvers are cleaned by draining the channel which causes a periodic shut-down of the fish bypass system. This creates greater opportunity for predation in the bypass pipes and loss of small fish through the primary louvers. The existing vertical traveling screen is moderately efficient at removing entrained aquatic debris (Boutwell and Sisneros 2007) and is rarely used because of logistic problems.

A Hydrolox traveling screen is currently being designed to replace the secondary louvers. This type of screen should improve debris removal while minimizing fish injury or loss during operation and cleaning. If successful, this type of screen may replace the louvers in the primary channel. A stationary Hydrolox traveling screen was tested in the secondary channel in FY 2009. These pilot tests found that 70–80% of released debris was captured by the screen when pegs were attached perpendicular to the screen face (B. Mefford, personal communication).

Problem Statement

Aquatic debris loads at the TFCF have increased since the 1950s when the louver-bypass system was designed. This debris impacts facility operations and potentially salvage efficiency (Boutwell and Sisneros 2007). The secondary channel at the TFCF will be used to test the performance of a Hydrolox traveling screen at removing debris and diverting fish into the bypass system.

Goals and Hypotheses

Goals:

1. Compile existing fish salvage and hydraulic data for the secondary channel louver system.
2. Write draft test plan (once final secondary channel Hydrolox design is completed).

Materials and Methods

Fish release-recapture experiments will be used to test efficiency of the new screen. The basic experiment will involve releasing 40 fish into the primary channel bypasses and 10 fish into a holding tank under several secondary channel flow and debris conditions. Detailed methods and experimental design will be written once final design is completed.

Coordination and Collaboration

These studies will be coordinated with the California Department of Fish and Game's Delta diversion facilities reporting program, and the Tracy Fish Collection Facility staff. All work will be reviewed by the Tracy Technical Advisory Team through progress updates on request and reviews of study plans and all reports.

Endangered Species Concerns

Incidental "take" of ESA listed salmon, steelhead, and delta smelt is possible and such fish will be returned to Delta waters as quickly as possible. The total number of each ESA species incidentally caught or collected during the experiment will be recorded and sent to the reporting agencies. The incidental take from this research is covered under the TFCF Section 10 permit.

Dissemination of Results (Deliverables and Outcomes)

We will provide an update on screen design and installation, and review of existing related information to the Tracy Technical Advisory Team in FY 2011.

Literature Cited

Boutwell, J.E. and D. Sisneros. 2007. *Water born debris removal evaluations using a traveling screen at the Tracy Fish Collection Facility, Tracy, California*. Tracy Fish Collection Facility Studies, Volume 33, U.S. Bureau of Reclamation, Mid-Pacific Region and Denver Technical Service Center.